

MIP8 / MIP9 / MIP10 / MIP11 BIOS V1.5x

| System Bios Setup - Utility v5.3 (C) 2005 General Software, Inc. All rights reserved | |
|---|-------------------------------------|
| System Information: | >Basic CMOS Configuration |
| Model: MIP10-A-1 | Features Configuration |
| Prod ID: MED-10xxx-yyy [z] | Onboard Devices Configuration |
| Serial #: 100 | Special Configuration |
| Model: MIP10-B-1 | Power Configuration |
| Prod ID: MED-10xxx-yyy [z] | PnP Configuration |
| Serial #: 100 | Shadow Configuration |
| BIOS Version: V1.5x | Password Configuration |
| Build Date: 08/07/09 | Save CMOS to nonvolatile Flash |
| BIOS No: MEV-10113-201 | Load CMOS from nonvolatile Flash |
| LAN: Dev 0x1076 R 0x05 | Reset CMO to last known values |
| MAC Addr: 00:60:C2:10:XX:XX | Reset CMOS to factory defaults |
| | Write to CMOS and Exit |
| | Exit without changing CMOS |
| ↑/↓/<Tab> to select. <Esc> to continue (no save) www.gensw.com | |

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1 INTRODUCTION

1.1 BIOS FEATURES

The MIP8 / MIP9 / MIP10 / MIP11 BIOS V1.5x supports the following standards and key features:

- ACPI 1.0
- Plug'n'Play
- USB Boot (Floppy disk, CD-ROM, Hard disk)
- USB Legacy Keyboard and Mouse
- PXE Network Boot
- Console Redirection over Serial Port

1.2 ABOUT THIS MANUAL

1.2.1 CONVENTIONS

This manual covers the BIOS for MIP8 / MIP9 / MIP10 / MIP11. Throughout the document, the term MIP is used to refer to all these MIP variants.

1.2.2 INTENDED USAGE

This manual provides all the information necessary to configure the MIP BIOS. The manual is written for technical personnel. It is recommended to use this manual in combination with the MIP User Manual.

NOTE

It is strongly recommended to read the MIP User Manual and this manual before the MIP is switched on.

1.3 MANUAL REVISIONS

1.3.1 RELATED PRODUCTS

| Manual Revision | Related To |
|-----------------|--|
| A | MIP10 BIOS V1.35 |
| B | MIP8 / MIP9 / MIP10 / MIP11 BIOS V1.5x |

1.3.2 REVISION HISTORY

| Manual Revision | Date | Description |
|-----------------|------------|----------------------------------|
| A | 2007-11-13 | Initial release of this document |
| B | 2009-08-12 | Reflect BIOS V1.5x features |

1.4 RELATED DOCUMENTATION

The following documents are related to this manual. For detailed Information about a specific MIP feature or setting please refer to these additional manuals.

| Reference | Description | Available from |
|-----------|-----------------|---|
| [1] | MIP User Manual | MPL AG: http://www.mpl.ch/t2760.html |

2 HARDWARE CONFIGURATION

2.1 INTERRUPTS (IRQs)

The standard PC AT architecture is limited to 16 Interrupts (IRQs). The following table shows the typical usage of the available interrupt lines on the MIP.

Please consult this table before changing IRQ assignments of devices in the BIOS or adding PC/104 expansion cards in order to avoid conflicts and to make sure that there will be sufficient IRQs available.

The MIP standard configuration uses all but two interrupts (5 and 11). IRQ 12 is also available if the following two conditions are met:

- 'PS/2 Config' (refer to section 3.7.5) is set to 'Auto' **and** no PS/2 mouse is connected
- 'UsbHid' (refer to section 3.6.7) is disabled

Additional interrupts can be made available by disabling onboard devices. Onboard devices that can be configured to use different interrupts are marked 'Configurable' in the table below.

| IRQ | Usage | Remarks | MIP default configuration |
|-----|---------------------------|---|---------------------------|
| 0 | System Timer | Not available | |
| 1 | Keyboard | Not available | |
| 2 | Cascade | Not available | |
| 3 | Serial Port 2 | Configurable / Available for PC/104 | Used |
| 4 | Serial Port 1 | Configurable / Available for PC/104 | Used |
| 5 | Not used | Configurable / Available for PC/104 | Available |
| 6 | Floppy Disk Controller | Available for PC/104 | Used |
| 7 | Parallel Port | Configurable / Available for PC/104 | Used |
| 8 | Real Time Clock (RTC) | Not available | |
| 9 | PCI Devices | Not available | |
| 10 | PCI Devices | Not available | |
| 11 | Not used | Configurable / Available for PC/104 | Available |
| 12 | PS/2 Mouse | Available for PC/104 if PS/2 mouse disabled and UsbHid disabled | |
| 13 | Floating Point Unit (FPU) | Not available | |
| 14 | Primary ATA Channel | Not available | |
| 15 | Secondary ATA Channel | Not available | |

For a PC/104 card configuration example, please refer to section 2.4.

2.2 MEMORY

PC/104 (ISA) and PC/104-Plus (PCI) add-on cards may require a certain amount of memory for installing their option ROMs or they have onboard memory that needs to be mapped into the system memory space. The memory area used for this purpose is limited to 000C0000h – 000DFFFFh.

Note: This area is 16kB (4000h) granular if used as shadow RAM for option ROMs. This means that although an option ROM may occupy only 2kB (800h), the rest of this 16kB area cannot be used by other devices. This implies that option ROMs always start and end on 16kB boundaries.

The area C0000h – CFFFFh is used by the VGA BIOS and is therefore not available for other devices.

The system BIOS is located at E0000h – FFFFFh (128kB).

The PXE Boot ROM can be disabled in BIOS setup (please refer to section 3.8.2) to free up memory ranges which can be used for other purposes. Option ROMs are installed starting at 0D0000h.

Fig. 1 shows the memory map with different configurations of the PXE option ROM included in the system BIOS.

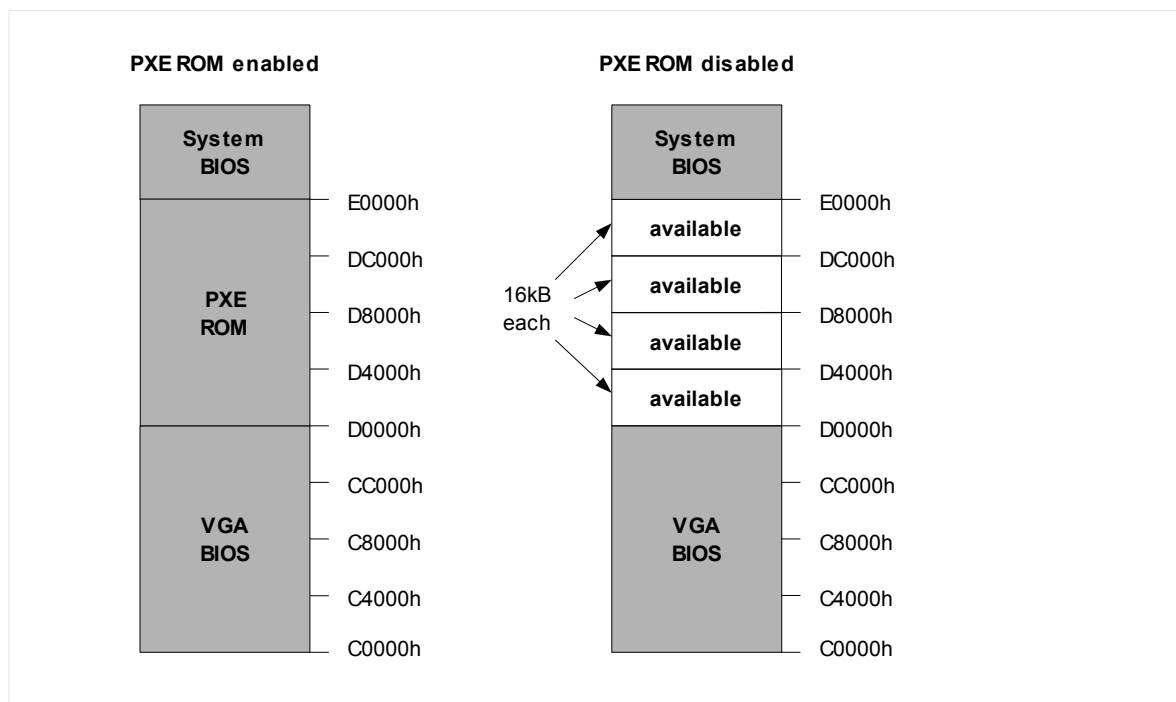


Figure 1: Memory Map

The free ranges in the figure above can be used as ISA memory for PC/104 cards (see section 3.8.4) or for additional option ROMs of add-on cards (see section 3.10).

For a PC/104 card configuration example, please refer to section 2.4.

2.3 I/O

Input/Output space is required by most PC/104 cards. The table below is an overview of the MIP's I/O space usage from 0000h to 03FFh, which is the important range for PC/104 cards.

'Configurable' devices can be set up to use a different I/O range, or can be disabled completely.

| I/O range | Usage | Remarks | MIP default configuration |
|---------------|------------------------|---------------|---------------------------|
| 03F8h – 03FFh | Serial port | Configurable | Used |
| 03F7h – 03F7h | Floppy disk controller | Configurable | Used |
| 03F6h – 03F6h | Primary ATA channel | Not available | |
| 03F0h – 03F5h | Floppy disk controller | Configurable | Used |
| 03E8h – 03EFh | Serial port | Configurable | Available |
| 03C0h – 03DFh | VGA | Not available | |
| 03B0h – 03BBh | VGA | Not available | |
| 0378h – 037Fh | Parallel port | Configurable | Used |
| 0376h – 0376h | Secondary ATA channel | Not available | |
| 0338h – 033Fh | Serial port | Configurable | Available |
| 02F8h – 02FFh | Serial port | Configurable | Used |
| 02E8h – 02EFh | Serial port | Configurable | Available |
| 0278h – 027Fh | Parallel port | Configurable | Available |
| 0238h – 023Fh | Serial port | Configurable | Available |
| 0228h – 022Fh | Serial port | Configurable | Available |
| 0220h – 0227h | Serial port | Configurable | Available |
| 01F0h – 01F7h | Primary ATA channel | Not available | |
| 0170h – 0177h | Secondary ATA channel | Not available | |
| 0000h – 00FFh | Various system devices | Not available | |

This leads to the following consecutive I/O ranges that can be used by PC/104 cards on a MIP with default configuration:

- 100h – 16Fh
- 180h – 1EFh
- 200h – 2DFh
- 300h – 370h
- 380h – 3AFh

For a PC/104 card configuration example, please refer to section 2.4.

2.4 EXAMPLE CONFIGURATION

The following is an example of how to configure a PC/104 add-on card. These cards commonly require manual configuration and can cause problems if they are not configured properly.

Note: PC/104 cards are ISA based, while PC/104-*Plus* cards are PCI based. PC/104-*Plus* cards generally do not require manual configuration.

In this example, a Softing CAN-AC2-104 CAN card (PC/104) is used.

Step 1 – Resources required by PC/104 card

- Check the resource requirements of the add-on card. Refer to the card's User Manual for the requirements. The CAN-AC2-104 board has the following requirements:
 - I/O range: 4 Byte area between 0000h and 03FFh
 - Memory range: 16kByte area between C8000h and F7FFFh
 - IRQ channel: One IRQ

Step 2 – Define card configuration

- Choose a resource configuration that is not conflicting with other system devices or installed cards. After checking with the available resources of the MIP, we chose the following values:
 - I/O range: 240h (check section 2.3 for available I/O ranges)
 - Memory range: DC000h (check section 2.2 for available memory ranges)
 - IRQ channel: 5 (check section 2.1 for available IRQs)

Note: Only the memory range needs to be configured in the BIOS setup! I/O range and interrupt channel do not need to be configured in the BIOS.
- Configure the selected I/O range on the card by setting the DIP switch accordingly. The memory and IRQ configurations for this card are done by software. However, other types of cards may have jumpers or DIP switches for memory and / or IRQ configuration. If so, these must be configured correctly.

Step 3 – Configure BIOS

- **I/O**
We chose an I/O range that is not used by any other device, therefore no configuration is needed.
- **Memory**
This card does not have an Option ROM, therefore Shadow memory must be disabled for the configured memory range.
 - Set up 'PC104 Mem Base Addr' and 'PC104 Mem Size' according to the chosen configuration. See section 3.8.4 for further information.
 - PC104 MEM Base Addr: DC000h
 - PC104 MEM Length: 16k
 - Disable Shadow Memory for the selected memory range. See section 3.10 for further information.
 - Shadow 16KB ROM at DC00: Disabled
- **IRQ**
We chose an IRQ that is not used by any other device, therefore no configuration is needed.

Step 4 – Use the card

- The MIP BIOS is now properly configured for the use of the CAN-AC2-104 card. After the installation of all necessary software and/or drivers, the card is operational.

2.5 ATA MASS STORAGE CONFIGURATION

The MIP features two ATA controllers, one Parallel ATA (P-ATA) and one Serial ATA (S-ATA) controller. They can be used in several different configurations, depending on the number and type of devices that are connected.

The two controllers are individual PCI functions:

P-ATA Controller: Bus 0 / Dev 31 / Fun 1 / Vendor ID 0x8086 / Device ID 0x25A2
S-ATA Controller: Bus 0 / Dev 31 / Fun 2 / Vendor ID 0x8086 / Device ID 0x25A3

The following tables show the possible configurations and the resulting relationship between the BIOS name and the physical ATA ports and channels as well as the controller that is active in the respective mode. The mode can be selected in the 'Special Configuration' menu (see section 3.8.3).

The default mode is Combined Mode, P-ATA primary.

NOTE

The Combined mode uses the S-ATA controller which also controls the P-ATA (Compact Flash) connector.

The BIOS name is used in the 'Basic CMOS Configuration' setup screen (see section 3.5) to configure the ATA drives and boot order.

P-ATA only:

| Active Controller | | |
|-------------------|--------------------|-----------|
| P-ATA | | |
| BIOS Name | Physical Interface | Channel |
| ATA 0 | CF Master | Primary |
| ATA 1 | N/A | |
| ATA 2 | N/A | Secondary |
| ATA 3 | N/A | |

S-ATA only:

| Active Controller | | |
|-------------------|--------------------|-----------|
| S-ATA | | |
| BIOS Name | Physical Interface | Channel |
| ATA 0 | SATA Port 0 | Primary |
| | N/A | |
| ATA 2 | N/A | Secondary |
| | N/A | |

Combined Mode, P-ATA Primary (default):

| Active Controller | | |
|-------------------|--------------------|-----------|
| S-ATA | | |
| BIOS Name | Physical Interface | Channel |
| ATA 0 | CF Master | Primary |
| ATA 1 | N/A | |
| ATA 2 | SATA Port 0 | Secondary |
| ATA 3 | N/A | |

NOTE

The ATA Mode should NOT be modified after the installation of the operating system.
The OS might not boot anymore if the mass storage controller has changed!

2.6 GRAPHICS CONFIGURATION

2.6.1 FLAT PANEL DISPLAY (LVDS) INTERFACE

The MIP features an internal LVDS connector for a flat panel display.

More information about the LVDS connector can be found in the MIP User Manual.

NOTE

All configuration options in this chapter are used for the LVDS port only. If the monitor is connected to the DVI-I port of the MIP and the internal LVDS port is not used, these options should not be modified.

2.6.1.1 DISPLAY TIMINGS

The timings for different flat panel types are set with switches 5, 6, 7, 8 of DIP switch 2 (please refer to the MIP User Manual for further information).

NOTE

If a valid panel type is selected, the DVI-I port of the MIP will be disabled and cannot be used in environments that do not have an Intel Graphics driver (e.g. POST, DOS).

WARNING

Panel timing settings must be changed only if the system is not powered and BEFORE a LVDS display is connected.

In BIOS V1.5x, the following timings are implemented:

| SW2-5 | SW2-6 | SW2-7 | SW2-8 | Panel type | Resolution | Mode information |
|-------|-------|-------|-------|--------------------|-------------|-------------------------------|
| ON | ON | ON | ON | Panel 1 | 640 x 480 | Single channel, data format 1 |
| OFF | ON | ON | ON | Panel 2 | 800 x 600 | Single channel, data format 1 |
| ON | OFF | ON | ON | Panel 3 | 1024 x 768 | Single channel, data format 1 |
| OFF | OFF | ON | ON | Panel 4 | 1280 x 1024 | Dual channel, data format 1 |
| ON | ON | OFF | ON | Panel 5 | 1366 x 768 | Single channel, data format 0 |
| OFF | ON | OFF | ON | Panel 6 | 1920 x 1080 | Dual channel, data format 1 |
| ON | OFF | OFF | ON | Panel 7 | 1024 x 768 | Single channel, data format 0 |
| OFF | OFF | OFF | ON | Panel 8 | 800 x 600 | Single channel, data format 0 |
| ON | ON | ON | OFF | Panel 9 | (reserved) | Not used – LVDS port disabled |
| OFF | ON | ON | OFF | Panel 10 | (reserved) | Not used – LVDS port disabled |
| ON | OFF | ON | OFF | Panel 11 | (reserved) | Not used – LVDS port disabled |
| OFF | OFF | ON | OFF | Panel 12 | (reserved) | Not used – LVDS port disabled |
| ON | ON | OFF | OFF | Panel 13 | (reserved) | Not used – LVDS port disabled |
| OFF | ON | OFF | OFF | Panel 14 | (reserved) | Not used – LVDS port disabled |
| ON | OFF | OFF | OFF | Panel 15 | (reserved) | Not used – LVDS port disabled |
| OFF | OFF | OFF | OFF | Panel 16 (default) | (reserved) | Not used – LVDS port disabled |

2.6.1.2 BACKLIGHT INVERTER TYPES

The type of backlight inverter used for the flat panel is set with switches 2, 3, 4 of DIP switch 2 (please refer to the MIP User Manual for further information).

This setting defines the voltage range that controls backlight intensity.

WARNING

If the backlight brightness is controlled via the MIP, the backlight inverter type must be configured correctly!
Failure to do so may cause damage to the inverter and/or the panel backlight.

In BIOS V1.5x, the following inverter types are implemented:

| SW2-2 | SW2-3 | SW2-4 | Inverter type | Voltage range | Min. brightness | Max. brightness |
|-------|-------|-------|------------------|-------------------|-----------------|-----------------|
| OFF | OFF | OFF | Type 1 (default) | 0 Volt – 5 Volt | 0 Volt | 5 Volt |
| ON | OFF | OFF | Type 2 | 5 Volt – 0 Volt | 5 Volt | 0 Volt |
| OFF | ON | OFF | Type 3 | 1.8 Volt – 0 Volt | 1.8 Volt | 0 Volt |
| ON | ON | OFF | Type 4 | 0 Volt – 2 Volt | 0 Volt | 2 Volt |
| OFF | OFF | ON | Type 5 | (reserved) | not defined | not defined |
| ON | OFF | ON | Type 6 | (reserved) | not defined | not defined |
| OFF | ON | ON | Type 7 | (reserved) | not defined | not defined |
| ON | ON | ON | Type 8 | (reserved) | not defined | not defined |

2.6.1.3 BIOS CONFIGURATION

The flat panel related BIOS settings are located in the Special Configuration Menu (refer to section 3.8).

Note: These options are only active if a LVDS panel is connected and properly configured via DIP switches. If the monitor is connected to the DVI-I port of the MIP, these options are inactive and do not affect the display output.

2.6.1.3.1 PANEL FITTING

This option controls the fitting of the panel contents.

If the native resolution of a panel does not correspond to the software resolution, the contents is either stretched to fit the native screen resolution or centered, which results in a black frame around the actual screen content.

Panel Fitting is only used in environments without Intel Graphics driver installed (e.g. POST screen, DOS). If an operating system with Intel Graphics driver is started, this setting can be overridden by the driver.

| Panel Fitting | Controls panel fitting behavior | |
|---------------|---------------------------------|--|
| default | All Stretched | Always fit the screen size (default) |
| | Gfx Stretched | Graphics Modes are stretched to fit the screen |
| | Text Stretched | Text modes are stretched to fit the screen |
| | All Centered | Both Graphics and Text modes are centered |

2.6.1.3.2 PANEL BACKLIGHT

This option selects whether the LVDS panel backlight brightness is controlled by BIOS setting or by other means (Hardware up/down switches or application software control).

When set to 'HW/App Control', the backlight can be dimmed by connecting UP and DOWN switches / buttons to the appropriate connector on the MIP (please refer to the MIP User Manual for further information).

| Panel Backlight | Defines backlight brightness control | |
|-----------------|--------------------------------------|--|
| | HW/App Control | Brightness controlled by hardware or application |
| default | BIOS Control | Brightness controlled by BIOS setup |

2.6.1.3.3 BRIGHTNESS LEVEL

This option controls the brightness level of the panel backlight, if 'Panel Backlight' is set to 'BIOS Setup'. The brightness can be adjusted in 5% increments.

Note: Modifying this option changes the backlight brightness instantly. However, it is still required to write the settings to CMOS when leaving the BIOS setup. Otherwise, the previous brightness setting will be used after leaving the setup.

| Brightness Level | Selects brightness level of the backlight, if 'BIOS Control' is selected | |
|------------------|--|--------------------------|
| | Minimal | Minimal brightness level |
| | 5% | 5% brightness level |
| | 10% | 10% brightness level |
| | ... | ... |
| | ... | [5% increments] |
| | ... | ... |
| | 95% | 95% brightness level |
| default | 100% | 100% brightness level |

3 BIOS

3.1 BIOS UPDATE

The system BIOS of the MIP resides in a FLASH memory. Therefore BIOS upgrading with an additional utility is easily possible.

For BIOS upgrading, download the Windows executable program file from the MPL AG homepage www.mpl.ch. This file creates a bootable floppy disk including all the files necessary to update the BIOS.

1. Download BIOS upgrade file suitable for your MIP.
2. Execute the BIOS upgrade file to create the bootable BIOS upgrade disk.
3. Boot your MIP with the BIOS upgrade disk.
4. Follow the instructions on the screen. You can choose to save the current BIOS version to the disk as a backup in case you want to revert the update.
5. BIOS upgrade starts and informs you of the progress.
6. Power down the system after the BIOS update.

The new BIOS takes control the next time you start up your MIP.

CAUTION

If something fails (e.g., loss of power) during BIOS upgrading (especially after erasing the FLASH memory) and the utility can not terminate properly, the MIP will no longer have a valid BIOS!

In these cases, contact MPL AG to start up the system again.

If your system is not equipped with a floppy drive, use one of the following ways to upgrade the BIOS:

1. External USB floppy drive

The BIOS Upgrade Disk can be booted with an USB floppy drive.

2. CD ROM drive (external USB drive or internal ATA drive)

If your system has a CD ROM drive, the BIOS Upgrade Disk can be used as boot image to create a bootable CD ROM.

3. Hard Disk drive (external USB drive or internal ATA drive)

If your system hard disk contains a DOS partition, you can start the BIOS upgrade from there. If your system hard disk does not contain a DOS partition, you can temporarily install a different hard drive that boots a DOS. This hard drive can either be connected to one of the P-ATA / S-ATA ports or externally to the USB port.

4. Network (PXE) boot

It is possible to boot the BIOS Upgrade Disk via network. The boot server in the network must be configured to provide an image created from the BIOS Upgrade Disk as boot file.

3.2 BOOT SCREEN

At POST (**P**ower **O**n **S**elf **T**est), various information about the system configuration is displayed.

3.2.1 BIOS RELEASE INDEX

The BIOS release index and CPU information are shown during POST. The CPU signature (06D6) contains family (6), model (D) and stepping (6) information of the installed processor, and the actual CPU speed is displayed as well. This information changes according to the installed processor type.

The MIP type (MIP10) is displayed along with the BIOS version (V1.5x) and BIOS identification number (MEV-10113-201).

The following figure shows how this information is displayed, with the 1.4GHz Intel® Pentium® M CPU as example:

```
MPL MIP10 BIOS V1.5x - Pentium-M (06D6) at 1400MHz
MEV-10113-201
```

Figure 2: BIOS Release Index

3.2.2 PCI DEVICES

At POST, the PCI devices installed in the system are listed. The figure below shows the typical PCI devices present on the MIP board.

NOTE: All additional PC/104-*Plus* and/or PCI devices installed in the system will appear on bus 02 and above.

```
PCI Device Table.
Bus Dev Func VendID DevID Class          Irq
00 00 00 8086 3580 Host Bridge
00 00 01 8086 3584 System
00 00 03 8086 3485 System
00 02 00 8086 3582 VGA Display      10
00 02 01 8086 3582 Display
00 1C 00 8086 25AE PCI-to-PCI Bridge
00 1D 00 8086 25A9 Serial Bus      10
00 1D 01 8086 25AA Serial Bus      10
00 1D 04 8086 25AB System
00 1D 05 8086 25AC IRQ Controller
00 1D 07 8086 25AD Serial Bus      10
00 1E 00 8086 244E PCI-to-PCI Bridge
00 1F 00 8086 25A1 ISA Bridge
00 1F 01 8086 25A2 IDE Controller    14
00 1F 03 8086 25A4 Serial Bus      10
00 1F 05 8086 25A6 Audio           10
01 01 00 8086 1076 Ethernet          9
02 06 00 100B 0021 ISA Bridge
```

Figure 3: PCI Device Table

3.2.3 MASS STORAGE DEVICES

The following example shows how mass storage devices are listed.

| | | | |
|---|-----------------|----------|-----------------|
| CDROM Device(s): | | | |
| ATA 2: Pioneer DVD-ROM ATAPIModel D E1.21 | | | |
| ATA Device(s): | | | |
| ATA 0: | HTS424040M9AT00 | MA20A71A | MPA2412Q2GW4T12 |

Figure 4: Mass Storage Device Table

Each installed ATA device is listed with device location (1st column), device name (2nd column), firmware revision (3rd column) and model no. (4th column).

For more information about the drive location, please refer to section 2.5.

The table is divided into **CDROM Device(s)** and **ATA Device(s)**.

CDROM devices are optical devices such as CD-ROM drives, DVD drives etc. Additionally, if the BIOS is configured to boot from a CD-ROM drive, a message indicating the search for a bootable image on the disk appears, as follows:

| | | | |
|---|--|--|--|
| CDROM Device(s): | | | |
| ATA 2: Pioneer DVD-ROM ATAPIModel D E1.21 | | | |
| Searching for El Torito Bootable Image... Found a bootable image. | | | |

Figure 5: CDROM Device Table

Note: The "Searching for El Torito Bootable Image" message appears also with USB CD-ROM drives. However, they are not listed in the device table. The table lists only ATA devices.

3.3 ENTERING BIOS SETUP

The BIOS Setup is entered by pressing the key at POST, indicated by the following message:

| |
|-------------------------------------|
| Hit if you want to run SETUP. |
|-------------------------------------|

Figure 6: Enter Setup Message

If the console is being redirected, the key combination <CTRL>+<C> must be sent from the serial terminal program for entering the BIOS Setup. Please refer to section 3.6.6 for more information about Console Redirection.

If the system has a password set (refer to section 4 for further information), it is necessary to key in the password in order to enter the BIOS Setup. Without the password, it is not possible to enter the BIOS Setup.

3.4 MAIN BIOS SETUP SCREEN

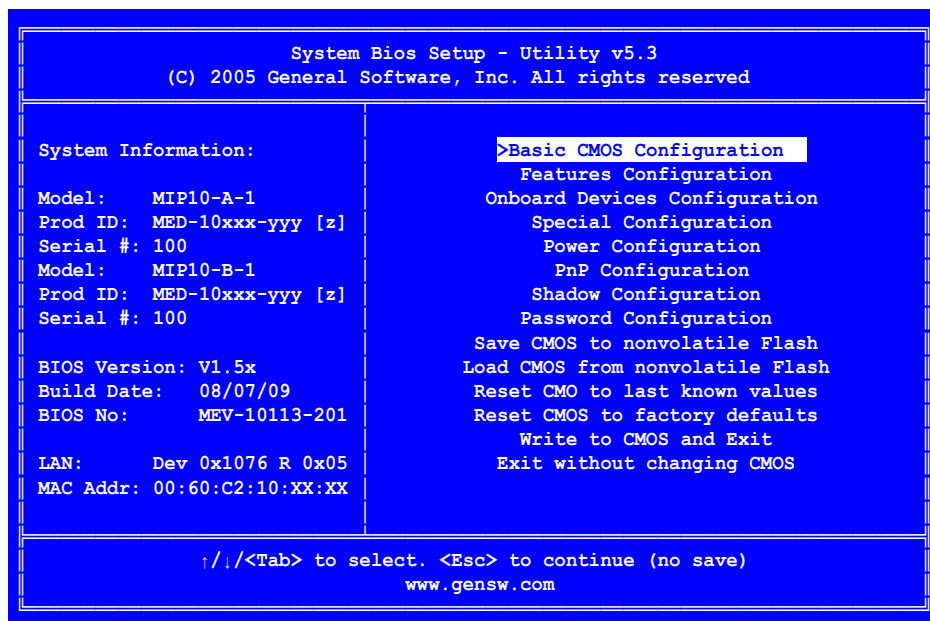


Figure 7: Main BIOS Setup Screen

3.4.1 SYSTEM INFORMATION

The left side of the main setup screen displays detailed information about the system.

3.4.1.1 MODEL

These are the exact product names of both the processor board ('A') and the peripherals board ('B').

3.4.1.2 PROD ID

These are the product IDs and revisions of both the processor board ('A') and the peripherals board ('B').

3.4.1.3 SERIAL

The serial numbers of both the processor board ('A') and the peripherals board ('B') are displayed here.

3.4.1.4 BIOS VERSION

This reflects the BIOS version which is installed on the MIP.

3.4.1.5 BUILD DATE

This is the build date of the installed BIOS version.

3.4.1.6 BIOS NO

This is the product number of the installed BIOS version.

3.4.1.7 LAN

This is the device ID and revision of the onboard Network Interface Controller.

3.4.1.8 MAC ADDR

The unique Media Access Control address of the onboard LAN is displayed here. It is six bytes long and the first three bytes are always 00:60:C2 for MPL products. The last three bytes are different on every MIP.

3.4.2 MAIN SETUP MENU

The right side of the main setup screen contains the menu used to navigate through the BIOS setup options. The menu entries will be discussed in detail below.

3.4.2.1 SAVE CMOS TO NONVOLATILE FLASH

This feature writes the current BIOS settings to the Flash. Please refer to section 5 for detailed information about nonvolatile BIOS setup.

3.4.2.2 LOAD CMOS FROM NONVOLATILE FLASH

Use this feature to manually read the BIOS settings from the Flash. Please refer to section 5 for detailed information about nonvolatile BIOS setup.

3.4.2.3 RESET CMOS TO LAST KNOWN VALUES

This option discards changes made during this BIOS Setup session by reloading the values from the CMOS RAM.

3.4.2.4 RESET CMOS TO FACTORY DEFAULTS

This option resets the BIOS settings to their default values.

3.4.2.5 WRITE TO CMOS AND EXIT

This option is used leave the BIOS setup and write the current BIOS settings to the CMOS RAM. The system will reboot automatically.

3.4.2.6 EXIT WITHOUT CHANGING CMOS

Use this option to leave the BIOS setup without saving the settings to CMOS RAM.

3.5 BASIC CMOS CONFIGURATION

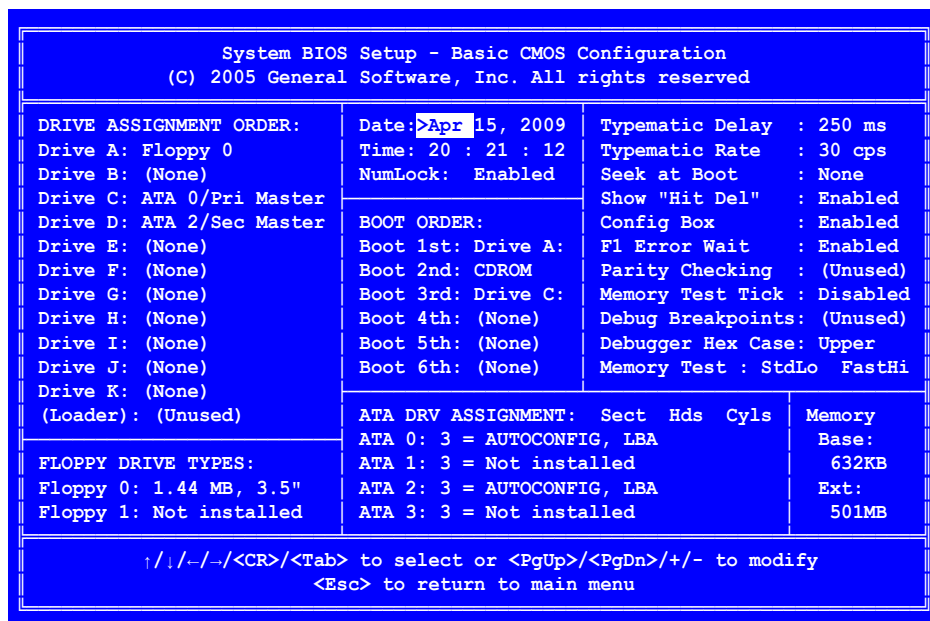


Figure 8: Basic CMOS Configuration Screen

3.5.1 DRIVE ASSIGNMENT ORDER

This field lets you configure the drive assignment. Take care that the first floppy drive is assigned to 'Drive A' and the first hard disk drive to 'Drive C'.

The following table shows the possible settings for drives A: through K: . Please note that only drive A: and B: are selectable to be floppy drives.

In order to avoid unnecessary searching for devices during boot up, only drives that are actually connected to the system should be selected here.

| Drive Assignment Order | | |
|------------------------|--------------------------|---|
| None | No assignment | |
| Floppy 0 | First floppy drive | |
| Floppy 1 | Second floppy drive | |
| USB Floppy | USB floppy drive | |
| ATA 0/Pri Master | ATA 0 (Primary Master) | Please refer to section 2.5 for more information about ATA Mass Storage Configuration |
| ATA 1/Pri Slave | ATA 1 (Primary Slave) | |
| ATA 2/Sec Master | ATA 2 (Secondary Master) | |
| ATA 3/Sec Slave | ATA 3 (Secondary Slave) | |
| USB Hard Drive | USB hard drive | |

3.5.2 FLOPPY DRIVE TYPES

Two floppy drives can be used (Floppy 0, Floppy 1), and this option selects the type of each drive.

| Floppy Drive Types | |
|--------------------|-----------------------------------|
| Not installed | No assignment |
| 720 KB, 3.5" | 720 Kbyte, 3.5 inch floppy drive |
| 1.44 MB, 3.5" | 1.44 Mbyte, 3.5 inch floppy drive |
| 2.88 MB, 3.5" | 2.88 Mbyte, 3.5 inch floppy drive |
| 360 KB, 5.25" | 360 Kbyte, 5.25 inch floppy drive |
| 1.2 MB, 5.25" | 1.2 Mbyte, 5.25 inch floppy drive |

3.5.3 BOOT ORDER

This table determines the boot order of the system drives. Set the drive letters according to the assignments made in the drive assignment order table, e.g. 'Drive A:' is equal to 'Drive A:' in the drive assignment order table.

To boot from a bootable CD-ROM media, choose 'CDROM', not the drive letter of the CD-ROM drive. Also make sure that 'ATA DRIVE ASSIGNMENT' is set to 'ATA CDROM' if the drive is connected via ATA.

If the CD-ROM drive is connected via USB, choosing 'CDROM' is sufficient. For more information about booting from USB CD-ROM drives, please refer to section 6.

| Boot Order | |
|------------|--|
| Boot 1st | First boot device (defaults to 'A:') |
| Boot 2nd | Second boot device (defaults to 'CDROM') |
| Boot 3rd | Third boot device (defaults to 'C:') |
| Boot 4th | Fourth boot device (defaults to 'None') |
| Boot 5th | Fifth boot device (defaults to 'None') |
| Boot 6th | Sixth boot device (defaults to 'None') |

3.5.4 ATA DRIVE ASSIGNMENT

This selects the installed drive type for each of the four possible ATA connections. Please refer to section 2.5 for more information about ATA Mass Storage Configuration.

| ATA Drv Assignment | |
|----------------------|---|
| Not installed | No drive installed |
| User Type | The 'USER TYPE' allows to select the maximum cylinders, heads and sectors per track associated with the connected IDE drive. |
| Autoconfig, Physical | The 'PHYSICAL' type instructs the BIOS to query the drive's geometry from the controller on each POST. This setting is limited to drives of 512 MB or less. |
| Autoconfig, LBA | The 'LBA' type instructs the BIOS to query the drive's geometry from the controller on each POST but then translate the geometry according to the LBA standard. This is the recommended setting. This setting may also be used with a CD-ROM drive if booting from CD-ROM is not needed. |
| Autoconfig, CHS | The 'CHS' type instructs the BIOS to query the drive's geometry from the controller on each POST but then translate the geometry according to the Phoenix CHS convention. |
| ATA CDROM | The 'ATA CDROM' type indicates the drive is a CD-ROM drive, not a hard disk. It forces the BIOS to search for a bootable CD-ROM media during POST. To save POST time if booting from CD-ROM is not needed, use 'AUTOCONFIG, LBA' instead. |

3.5.5 GENERAL SETTINGS

| General Settings | | |
|-------------------|---|---|
| Typematic Delay | Delay from pressing and holding a key on the keyboard until the start of character repeating | |
| Typematic Rate | Character repetition rate (characters per second; cps) | |
| Seek at Boot | None | Default |
| | Floppy | Seek for floppy |
| | IDE | (obsolete) |
| | Both | (obsolete) |
| Show "Hit DEL" | Enabled | Show at startup the string "Hit Del to enter the system BIOS" (default) |
| | Disabled | Do not show the string "Hit Del to enter the system BIOS" |
| Config Box | Enabled | Show the configuration box at startup (default) |
| | Disabled | Don't show the configuration box |
| F1 Error Wait | Enabled | Wait for F1 key press if an error is encountered at POST (default) |
| | Disabled | Do not wait for F1 key press |
| Parity Checking | (Unused) | This option is not used |
| Memory Test Tick | Enabled | Click speaker during memory test (default) |
| | Disabled | Don't click speaker during memory test |
| Debug Breakpoint | (Unused) | Not used |
| Debugger Hex Case | Upper | Not used |
| | Lower | |
| Memory Test | Specifies what type of memory test to perform at POST. Can be selected independently for low (below 1 Mbyte) and high (above 1 Mbyte) memory. | |
| | Fast | Performs a fast memory test (reduces POST time) |
| | Std | Performs a standard memory test (default) |
| | Full | Performs an exhaustive memory test (increases POST time) |

3.6 FEATURES CONFIGURATION

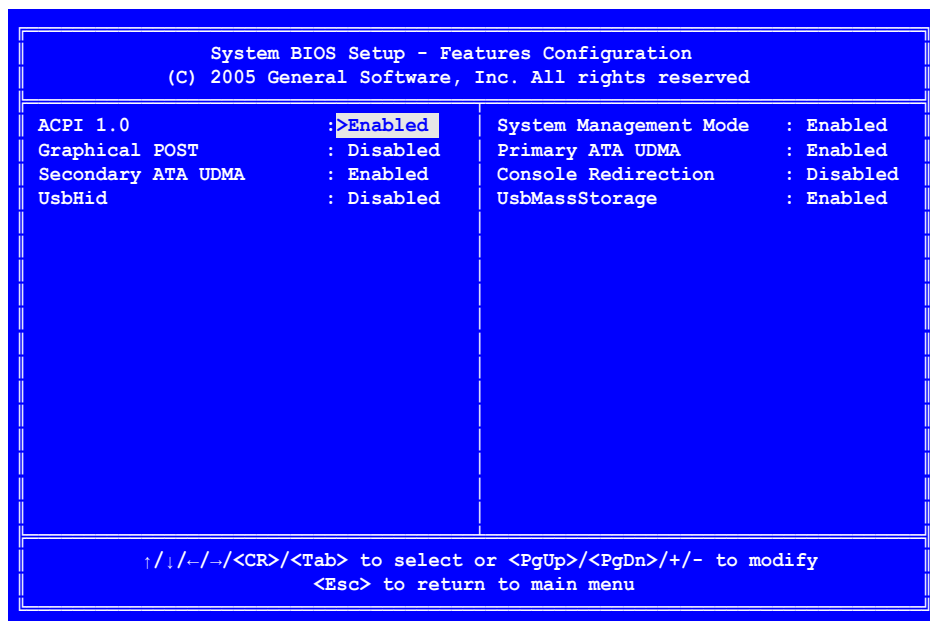


Figure 9: Features Configuration Screen

3.6.1 ACPI 1.0

This option enables or disables support for ACPI V1.0. Enabling this option introduces power saving features such as Hibernate Mode and Soft Off functionality, if the operating system supports ACPI.

Note: This setting should not be changed once the operating system is installed. Unexpected system behavior could be the result.

| ACPI 1.0 | | |
|----------|----------|------------------|
| | Disabled | Disable ACPI 1.0 |
| default | Enabled | Enable ACPI 1.0 |

3.6.2 SYSTEM MANAGEMENT MODE

This option enables or disables System Management Mode (SMM). SMM is a CPU mode transparent to the foreground OS.

There are several tasks that are running in SMM. This includes the following BIOS features which are only available if SMM is enabled:

- USB Mass Storage Support
- USB Legacy Keyboard/Mouse Support
- Some VGA functions (DVI transmitter, LVDS)
- Wake Up Events (refer to section 3.9)

Therefore, it is strongly recommended to leave this setting at its default value (Enabled).

Note: Due to its nature, the SMM may cause problems if the application requires hard real time capabilities. The setup options 'UsbHid' (refer to section 3.6.7) and 'UsbMassStorage' (refer to section 3.6.8) are provided to individually disable SMM features in case of problems.

| System Management Mode | | |
|------------------------|----------|--------------------------------|
| | Disabled | Disable System Management Mode |
| default | Enabled | Enable System Management Mode |

3.6.3 GRAPHICAL POST

This options lets the system boot with a graphical splash screen instead of the standard, text-based POST (Power On Self Test) progress indicator.

| Graphical POST | | |
|----------------|----------|-------------------------------|
| default | Disabled | Show text information at POST |
| | Enabled | Show splash screen at POST |

3.6.4 PRIMARY ATA UDMA

This option controls Ultra DMA setting of the primary ATA channel.

If 'Enabled', the ATA devices on the primary ATA channel are configured for their fastest UDMA mode.

If 'Disabled', the ATA devices run in PIO mode.

Note: Which physical channel is Primary depends on the selected Mass Storage Mode. Please refer to section 2.5 for further information.

| Primary ATA UDMA | | |
|------------------|----------|--|
| | Disabled | UDMA Mode disabled for Primary ATA channel |
| default | Enabled | UDMA Mode enabled for Primary ATA channel |

3.6.5 SECONDARY ATA UDMA

This option controls Ultra DMA setting of the secondary ATA channel.

If 'Enabled', the ATA devices on the secondary ATA channel are configured for their fastest UDMA mode.

If 'Disabled', the ATA devices run in PIO mode.

Note: Which physical channel is Secondary depends on the selected Mass Storage Mode. Please refer to section 2.5 for further information.

| Secondary ATA UDMA | | |
|--------------------|----------|--|
| | Disabled | UDMA Mode disabled for Secondary ATA channel |
| default | Enabled | UDMA Mode enabled for Secondary ATA channel |

3.6.6 CONSOLE REDIRECTION

This option controls console redirection. Standard behavior is local display / keyboard.

When set to 'Enabled', console output is routed to Serial Port 1 @ 9600bps, 8N1. There will be no boot messages on the standard display.

| Console Redirection | | |
|---------------------|----------|-------------------------------------|
| default | Disabled | Console not redirected |
| | Enabled | Console redirected to Serial Port 1 |

3.6.7 USB HID

This option enables USB HID (Human Interface Device) support for legacy environments, such as DOS. Supported devices are keyboards and mice.

This feature requires System Management Mode enabled. If System Management Mode is disabled, UsbHid will be disabled as well. Please refer to section 3.6.2 for more information about SMM.

Note: If UsbHid is enabled, IRQ12 will be no longer available for PC/104 devices, even if no PS/2 mouse is connected. Please refer to section 2.1 for more information about Interrupt usage.

| UsbHid | | |
|---------|----------|--|
| default | Disabled | Legacy Human Interface Device support disabled |
| | Enabled | Legacy Human Interface Device support enabled |

3.6.8 USB MASS STORAGE

This option controls USB Mass Storage support for legacy environments and for the purpose of booting from USB devices. Please refer to section 6 for more information about USB Boot.

This feature requires System Management Mode enabled. If System Management Mode is disabled, UsbMassStorage will be disabled as well. Please refer to section 3.6.2 for more information about SMM.

Note: This feature needs to be enabled if the system is configured to boot from USB devices.

| UsbMassStorage | | |
|----------------|----------|--|
| | Disabled | USB Mass Storage Device support disabled |
| default | Enabled | USB Mass Storage Device support enabled |

3.7 ONBOARD DEVICES CONFIGURATION

The Onboard Devices Configuration setup contains options that may not be available on specific versions of the MIP8 / MIP9 / MIP10 / MIP11. If so, the particular option is grayed out and cannot be configured.

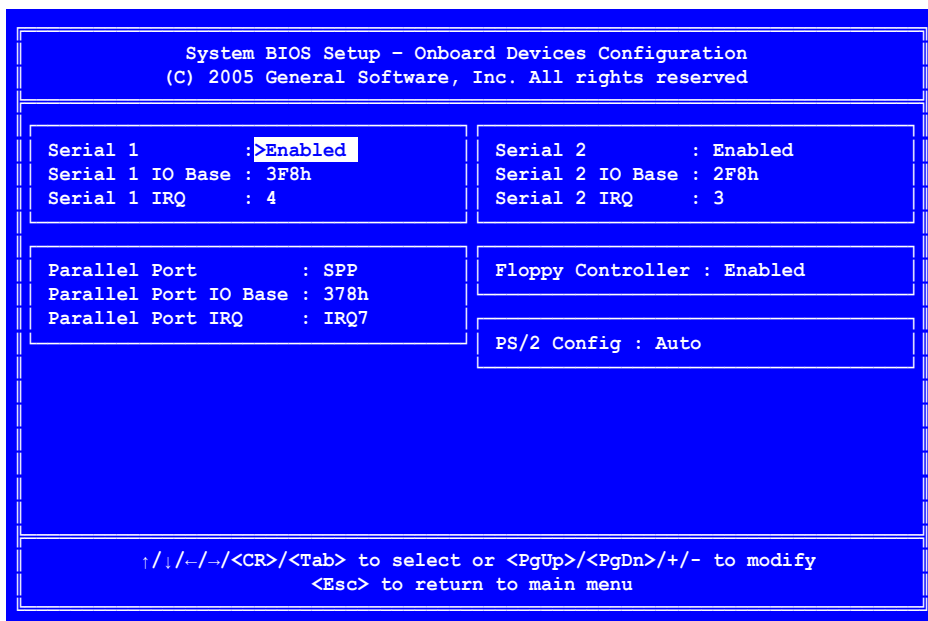


Figure 10: Onboard Devices Configuration Screen

3.7.1 SERIAL PORT 1

| Serial Port 1 | | |
|-----------------------|--------------------|---|
| | Enabled / Disabled | Serial Port 1 is disabled. The Serial Port 1 options described below become hidden. |
| default | RS232 | Serial Port 1 is enabled (RS232 mode) |
| Serial Port 1 IO Base | | |
| default | 03F8h | Use I/O base address 03F8h |
| | 02F8h | Use I/O base address 02F8h |
| | 03E8h | Use I/O base address 03E8h |
| | 02E8h | Use I/O base address 02E8h |
| | 0220h | Use I/O base address 0220h |
| | 0228h | Use I/O base address 0228h |
| | 0238h | Use I/O base address 0238h |
| | 0338h | Use I/O base address 0338h |
| Serial Port 1 IRQ | | |
| | 3 | Use IRQ 3 |
| default | 4 | Use IRQ 4 |
| | 5 | Use IRQ 5 |
| | 7 | Use IRQ 7 |
| | 11 | Use IRQ 11 |

3.7.2 SERIAL PORT 2

| Serial Port 2 | Selects Serial Port 2 mode | |
|-----------------------|--|---|
| | Disabled | Serial Port 2 is disabled. The Serial Port 2 options described below become hidden. |
| default | RS232 | Serial Port 2 is enabled (RS232 mode) |
| Serial Port 2 IO Base | Selects Serial Port 2 I/O base address | |
| | 03F8h | Use I/O base address 03F8h |
| default | 02F8h | Use I/O base address 02F8h |
| | 03E8h | Use I/O base address 03E8h |
| | 02E8h | Use I/O base address 02E8h |
| Serial Port 2 IRQ | Selects Serial Port 2 IRQ | |
| default | 3 | Use IRQ 3 |
| | 4 | Use IRQ 4 |
| | 5 | Use IRQ 5 |
| | 7 | Use IRQ 7 |
| | 11 | Use IRQ 11 |

3.7.3 PARALLEL PORT

| Parallel Port | Selects Parallel Port mode | |
|-----------------------|--|--|
| | Disabled | Parallel Port is disabled. The Parallel Port options described below become hidden. |
| default | SPP | Standard bidirectional mode |
| | Printer | Printer mode |
| | SPP / EPP 1.7 | SPP and EPP 1.7 mode |
| | SPP / EPP 1.9 | SPP and EPP 1.9 mode |
| | ECP | ECP mode |
| | ECP / EPP 1.7 | ECP and EPP 1.7 mode |
| | ECP / EPP 1.9 | ECP and EPP 1.9 mode |
| | PP Floppy | The parallel port connector uses 'Floppy Disk Mode' pin configuration (refer to the MIP User Manual). This mode allows external floppy disk drives to be connected to the parallel port. The original parallel port functionality is not available any more. |
| Parallel Port IO Base | Selects Parallel Port I/O base address | |
| default | 0378h | Use I/O base address 0378h |
| | 0278h | Use I/O base address 0278h |
| Parallel Port IRQ | Selects Parallel Port IRQ | |
| | 3 | Use IRQ 3 |
| | 4 | Use IRQ 4 |
| | 5 | Use IRQ 5 |
| default | 7 | Use IRQ 7 |
| | 11 | Use IRQ 11 |

3.7.4 FLOPPY CONTROLLER

This option controls the Floppy Controller.

Note: If a parallel port floppy is used, this option needs to be enabled also.

| Floppy Controller | Enables / disables the Floppy Controller | |
|-------------------|--|-------------------------------|
| | Disabled | Floppy Controller is disabled |
| default | Enabled | Floppy Controller is enabled |

3.7.5 PS/2 CONFIG

This option controls the PS/2 Keyboard and Mouse port(s).

On the MIP, the keyboard and mouse signals from the onboard connector J8-B can be routed to a single PS/2 connector (keyboard and mouse combined) or to two individual PS/2 connectors (one for keyboard, one for mouse).

The 'PS/2 Config' option changes how the keyboard/mouse signals are routed to the PS/2 connector(s) in order to cover the various possible configurations.

The default setting is 'Auto' which works with either a single PS/2 connector or with two individual PS/2 connectors.

In case of a single PS/2 connector, individual devices connected directly are detected automatically, as well as two devices connected through a Y-cable.

The options 'Straight' and 'Swapped' are provided for situations where problems with automatic detection may arise, e.g. if a KVM switch (Keyboard, Video, Mouse) is used and the devices do not get detected properly with the 'Auto' setting. These modes route the signals statically, there is no automatic routing.

The following table shows how the signals are routed in the Straight and Swapped modes.

| MIP8 / MIP9 / MIP10 / MIP11 Connector J8-B | Straight | Swapped |
|--|----------------|----------------|
| Pin 2 | Mouse Clock | Keyboard Clock |
| Pin 5 | Mouse Data | Keyboard Data |
| Pin 7 | Keyboard Clock | Mouse Clock |
| Pin 9 | Keyboard Data | Mouse Data |

If the setting is 'Auto', the system frees IRQ12 automatically if no mouse was detected. Please refer to section 2.1 for more information.

| PS/2 Config | Controls the signals on the PS/2 port(s) | |
|-------------|--|--|
| default | Auto | Keyboard and/or Mouse are detected automatically and the signals are routed appropriately. |
| | Straight | Keyboard and Mouse signals are routed in a straight fashion. No automatic detection takes place. |
| | Swapped | Keyboard and Mouse signals are routed in a swapped fashion. No automatic detection takes place. |

3.8 SPECIAL CONFIGURATION

The Special Configuration setup contains options that may not be available on specific versions of the MIP. If so, the particular option is grayed out and cannot be configured.

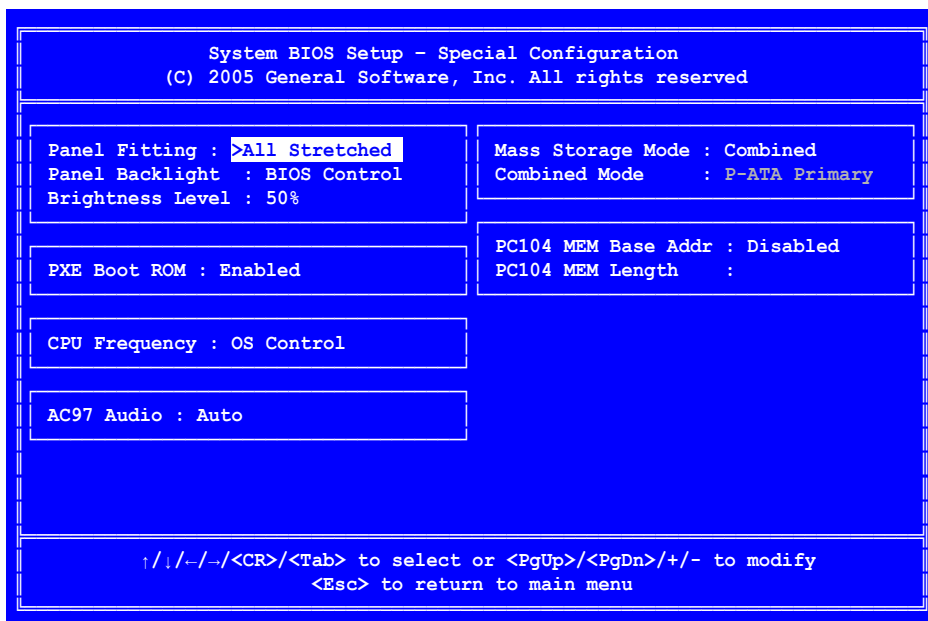


Figure 11: Special Configuration Screen

3.8.1 LVDS PANEL SETTINGS

These options control panels connected to the MIP via LVDS interface.

Please refer to section 2.6.1 for detailed information about the Flat Panel (LVDS) interface of the MIP.

Note: These options are only active if a LVDS panel is connected and properly configured via DIP switches. If the monitor is connected to the DVI-I port of the MIP, these options are inactive and do not affect the display output.

3.8.1.1 PANEL FITTING

This option controls the fitting of the panel contents.

If the native resolution of a panel does not correspond to the software resolution, the contents is either stretched to fit the native screen resolution or centered, which results in a black frame around the actual screen content.

| Panel Fitting | Controls panel fitting behavior | |
|---------------|---------------------------------|--|
| default | All Stretched | Always fit the screen size (default) |
| | Gfx Stretched | Graphics Modes are stretched to fit the screen |
| | Text Stretched | Text modes are stretched to fit the screen |
| | All Centered | Both Graphics and Text modes are centered |

3.8.1.2 PANEL BACKLIGHT

This option defines how the backlight brightness level is controlled. If set to 'BIOS Control', the brightness can be adjusted with the option 'Brightness Level'.

| Panel Backlight | Defines backlight brightness control | |
|-----------------|--------------------------------------|--|
| | HW/App Control | Brightness controlled by hardware or application |
| default | BIOS Control | Brightness controlled by BIOS setup |

3.8.1.3 BRIGHTNESS LEVEL

If 'Panel Backlight' is set to 'BIOS Control', the backlight brightness can be adjusted in 5% increments.

| Brightness Level | Selects brightness level of the backlight, if 'BIOS Control' is selected | |
|------------------|--|--------------------------|
| | Minimal | Minimal brightness level |
| | 5% | 5% brightness level |
| | 10% | 10% brightness level |
| | ... | ... |
| | ... | [5% increments] |
| | ... | ... |
| | 95% | 95% brightness level |
| default | 100% | 100% brightness level |

3.8.2 PXE BOOT ROM

This option enables / disables the integrated PXE Boot ROM which allows the system to boot from network (please refer to section 7 for detailed information).

Disabling this ROM frees memory in the D segment which can be used for other option ROMs or devices that use memory in this range. Please refer to section 2.2 for more details about the memory map.

| PXE Boot ROM | Enables / disables Network Boot | |
|--------------|---------------------------------|--------------------------|
| | Disabled | PXE Boot ROM is disabled |
| default | Enabled | PXE Boot ROM is enabled |

3.8.3 MASS STORAGE

This option configures the integrated ATA controllers.

Please refer to section 2.5 for more detailed information about the modes.

| Mass Storage Mode | Selects the Mass Storage Mode | |
|-------------------|---|---|
| | P-ATA Only | Use Parallel ATA (Compact Flash) only |
| | S-ATA Only | Use Serial ATA only |
| default | Combined | Use Serial ATA and one Parallel ATA channel (Compact Flash) |
| Combined Mode | Selects the primary channel for Combined Mode | |
| not configurable | P-ATA Primary | Parallel ATA channel (Compact Flash) is primary channel Serial ATA ports are secondary channel |

3.8.4 PC104 MEM BASE

This option reserves memory space for legacy ISA (PC/104) cards.

Note: C and D segments are also the space where option ROMs such as the integrated PXE ROM are loaded. Routing this memory space to PC/104 can result in loss of Option ROM functionality. Please refer to section 2.2 for further details about the default memory layout of the MIP.

| PC104 MEM Base Addr | Defines the base address of the memory range to be routed to PC/104 | |
|---------------------|---|---|
| default | Disabled | Memory window disabled. The MEM length option described below becomes hidden. |
| | D000 | Memory window starting at D0000h |
| | D400 | Memory window starting at D4000h |
| | D800 | Memory window starting at D8000h |
| | DC00 | Memory window starting at DC000h |
| PC104 MEM Length | Defines the size of the memory range | |
| default | 8k | Memory window size 8 k (2000h) |
| | 16k | Memory window size 16 k (4000h) |
| | 32k | Memory window size 32 k (8000h) |
| | 64k | Memory window size 64 k (10000h) |

3.8.5 CPU FREQUENCY

This option controls the CPU frequency.

The Intel® Pentium® M CPU of the MIP supports SpeedStep® technology which allows the CPU to change its speed on demand, automatically adapting to the CPU load.

To use the SpeedStep® feature, the operating system must support it natively (e.g. Windows XP, Windows Server 2003, Linux).

Note: Depending on the installed CPU type, the configurable frequency values as well as the availability of the SpeedStep® feature may vary.

| CPU Frequency | Controls the CPU speed | |
|---------------|------------------------|--|
| default | OS Control | CPU speed is controlled natively by the operating system. Requires that 'ACPI 1.0' feature (see section 3.6.1) is enabled. |
| | 600MHz | CPU runs fixed @ 600MHz without SpeedStep. |
| | 1400MHz | CPU runs fixed @ 1400MHz without SpeedStep. |

3.8.6 AC'97 AUDIO

This option controls the onboard AC'97 audio device.

| AC'97 Audio | Controls AC'97 audio device | |
|-------------|-----------------------------|--|
| default | Auto | AC'97 audio device is enabled automatically if a codec is present. If no codec is present, the AC'97 device is disabled. |
| | Disabled | Manually disable AC'97 audio device. |

3.9 POWER CONFIGURATION

The Power Configuration setup contains options that may not be available on specific versions of the MIP. If so, the particular option is grayed out and cannot be configured.

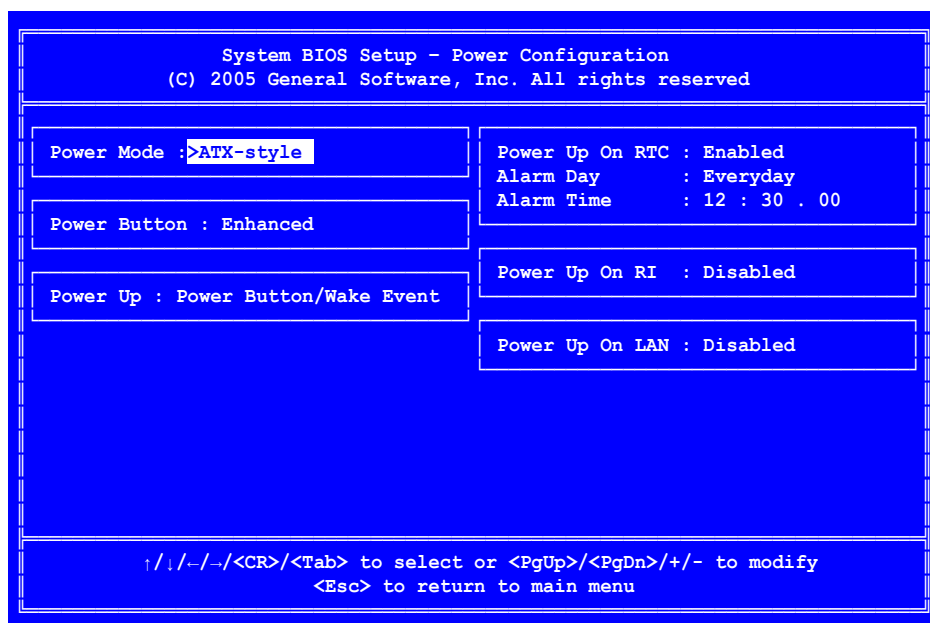


Figure 12: Power Configuration Screen

3.9.1 POWER-RELATED SETTINGS

These settings control the behavior of the MIP regarding power up.

Note: The wake events require that System Management Mode (please refer to section 3.6.2) is Enabled.

3.9.2 POWER MODE

This option must be set according to how the MIP is powered, in order to avoid illegal power situations.

Any powering setup that has the PC/104 bus still powered while the MIP enters S5 (Soft Off) or S4 (Hibernate/Suspend-to-Disk) power state, e.g. a setup using a Legacy PC/104 power supply, must have this option set to 'AT-style' to prevent the MIP from turning itself off when it enters S5 or S4 power state.

Please refer to the MIP10 User Manual for further information about powering options for the MIP.

| Power Mode | | |
|------------|-----------|--|
| | AT-style | The system will not turn off when going into S5 (Soft Off) or S4 (Hibernate/Suspend-to-Disk) power mode. This setting is intended for systems where the MIP is powered in such a way that the PC/104 bus always has power. |
| default | ATX-style | The system will turn off when going into S5 (Soft Off) or S4 (Hibernate/Suspend-to-Disk). This setting is intended for systems where the MIP is powered in such a way that the PC/104 bus will not be powered when the MIP enters S5 or S4 power mode. |

3.9.3 POWER BUTTON

This option controls how the BIOS handles the power button in non-ACPI environments (e.g. DOS) regarding shut down of the system.

In ACPI-enabled operating systems, the behavior of the power button will be controlled by the operating system itself, not by this setting.

Note: The Power Button always acts as a startup event, regardless of this setting, e.g. when the system is powered and is in S5 (Soft Off) mode, pressing the Power Button starts the system in any case.

| Power Button | Controls the behavior of the power button | |
|--------------|---|--|
| default | Legacy | Pressing the power button in a non-ACPI environment has no effect except when a Power Button Override (pressing and holding the power button for at least 4 seconds) is performed which shuts the system down. |
| | Enhanced | Pressing the power button in a non-ACPI environment puts the system into S5 (Soft Off) power state. |

3.9.4 POWER UP

This option controls the power up behavior of the system.

| Power Up | Controls the behavior of the power button | |
|----------|---|---|
| default | Immediately | The system starts up as soon as the supply voltage is turned on. If a Power Button Override has been performed previously, the power button must be pressed to start the system. |
| | Power Button/Wake Event | The system stays in S5 (Soft Off) when the supply voltage is turned on. To start the system, the power button must be pressed or a wake event must take place. |

3.9.5 POWER UP ON RTC

This option enables / disables Wake on RTC functionality which lets the system start up at a configurable time / day of month.

| Power Up On RTC | Enables / Disables Wake On RTC | |
|-----------------|--------------------------------|--|
| default | Disabled | The system does not wake on RTC. |
| | Enabled | The system starts at the configured time / day of month. |

3.9.5.1 ALARM DAY

This option configures the day of month for which the system starts up automatically at the configured Alarm Time (see section 3.9.5.2).

| Alarm Day | Selects the day of month for which Wake On RTC is enabled | |
|-----------|---|--|
| default | Everyday | The system starts daily at the configured time |
| | 01 | The system starts on the 1 st of each month at the configured time |
| | 02 | The system starts on the 2 nd of each month at the configured time |
| | ... | ... |
| | 30 | The system starts on the 30 th of each month at the configured time |
| | 31 | The system starts on the 31 st of each month at the configured time |

3.9.5.2 ALARM TIME

This sets the time at which the system should start up automatically.
Time format is **hh : mm . ss** (24-hour notation).

| Alarm Time | Configures the time at which the system starts up automatically | |
|------------|---|--|
| Hours | 00 | Hours of the Alarm Time (00 ... 23). |
| | ... | |
| | 23 | |
| Minutes | 00 | Minutes of the Alarm Time (00 ... 59). |
| | ... | |
| | 59 | |
| Seconds | 00 | Seconds of the Alarm Time (00 ... 59). |
| | ... | |
| | 59 | |

3.9.6 POWER UP ON RI

This option enables / disables Wake on RI (Ring Indicator) functionality.
If enabled, the system starts up automatically when the RI signal of Serial Port 1 or Serial Port 2 goes active.

Note: If the system was powered down by a Power Button Override (pressing and holding the power button for at least 4 seconds), the system will NOT start up if RI goes active. In this case, it is required to press the power button to start the system.

| Power Up On RI | Enables / disables Wake On Ring Indicator | |
|----------------|---|--|
| default | Disabled | The system does not start up if any Ring Indicator signal goes active. |
| | Enabled | The system starts up if any Ring Indicator signal goes active. |

3.9.7 POWER UP ON LAN

This option enables / disables Wake on LAN functionality.
If enabled, the system starts up automatically when the LAN controller detects a Magic Packet.

Note: If the system was powered down by a Power Button Override (pressing and holding the power button for at least 4 seconds), the system will NOT start up if the LAN controller detects a Magic Packet.

| Power Up On LAN | Enables / disables Wake On LAN | |
|-----------------|--------------------------------|--|
| default | Disabled | The system does not start up if a wake event comes in via LAN. |
| | Enabled | The system starts up if a wake event comes in via LAN. |

3.10 SHADOW RAM CONFIGURATION

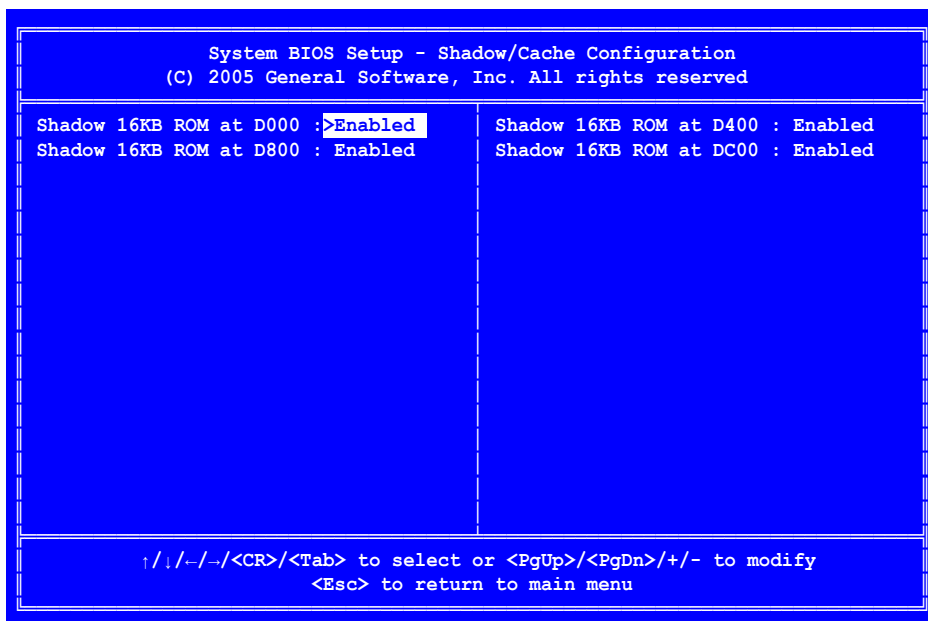


Figure 13: Shadow RAM Configuration Screen

Shadow Configuration controls the shadowability of certain memory ranges.

If a certain memory range is used as ISA (PC/104) memory, shadowing should be disabled.

If Option ROMs need to be installed, it must be assured that a consecutive Shadow area big enough to hold the Option ROM is enabled.

Please refer to section 2.2 for more details about the memory map.

| Shadow Region | Physical Address | Segment Address | | |
|------------------|------------------|-----------------|----------|---------|
| 16KB ROM at D000 | D0000h – D3FFFh | D000 – D3FF | Disabled | |
| | | | Enabled | default |
| 16KB ROM at D400 | D4000h – D7FFFh | D400 – D7FF | Disabled | |
| | | | Enabled | default |
| 16KB ROM at D800 | D8000h – DBFFFh | D800 – DBFF | Disabled | |
| | | | Enabled | default |
| 16KB ROM at DC00 | DC000h – DFFFFh | DC00 – DFFF | Disabled | |
| | | | Enabled | default |

3.11 PLUG-N-PLAY CONFIGURATION

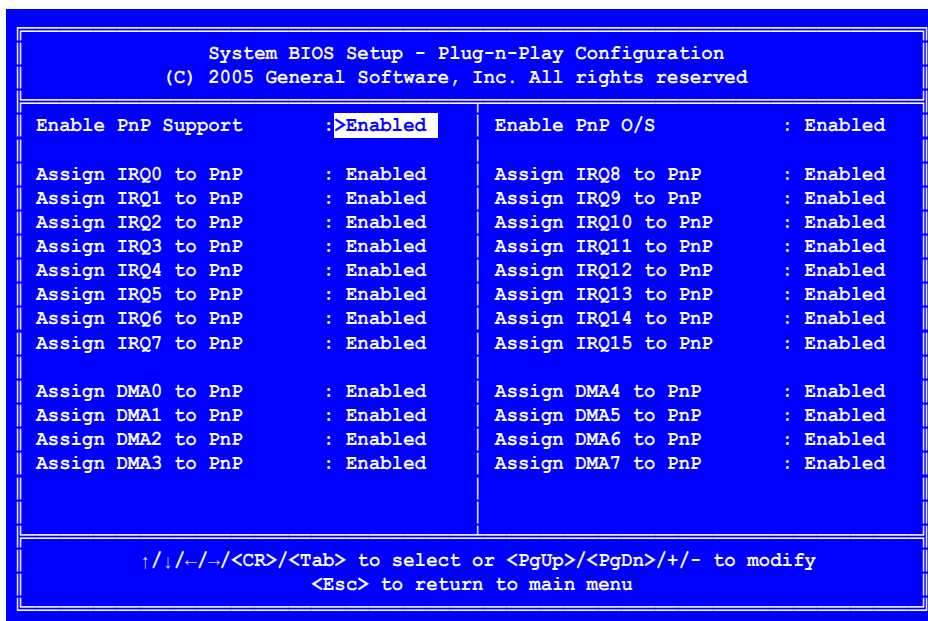


Figure 14: Plug-N-Play Configuration Screen

3.11.1 GENERAL PNP CONFIGURATION

| Enable PnP Support | Enables / Disables Plug-N-Play support | |
|--------------------|--|--|
| | Disabled | Plug-N-Play support is disabled |
| default | Enabled | Plug-N-Play support is enabled |
| Enable PnP O/S | Must be set according to the installed operating system (OS) | |
| | Disabled | Disable it if OS is not capable of PnP |
| default | Enabled | Enable it if OS is capable of PnP |

3.11.2 PNP IRQ CONFIGURATION

| Assign IRQx to PnP | Defines which IRQs are available for PnP devices | |
|--------------------|--|---|
| IRQ0 | Disabled | IRQ0 not available for PnP devices |
| | Enabled | IRQ0 available for PnP devices (default) |
| IRQ1 | Disabled | IRQ1 not available for PnP devices |
| | Enabled | IRQ1 available for PnP devices (default) |
| IRQ2 | Disabled | IRQ2 not available for PnP devices |
| | Enabled | IRQ2 available for PnP devices (default) |
| IRQ3 | Disabled | IRQ3 not available for PnP devices |
| | Enabled | IRQ3 available for PnP devices (default) |
| IRQ4 | Disabled | IRQ4 not available for PnP devices |
| | Enabled | IRQ4 available for PnP devices (default) |
| IRQ5 | Disabled | IRQ5 not available for PnP devices |
| | Enabled | IRQ5 available for PnP devices (default) |
| IRQ6 | Disabled | IRQ6 not available for PnP devices |
| | Enabled | IRQ6 available for PnP devices (default) |
| IRQ7 | Disabled | IRQ7 not available for PnP devices |
| | Enabled | IRQ7 available for PnP devices (default) |
| IRQ8 | Disabled | IRQ8 not available for PnP devices |
| | Enabled | IRQ8 available for PnP devices (default) |
| IRQ9 | Disabled | IRQ9 not available for PnP devices |
| | Enabled | IRQ9 available for PnP devices (default) |
| IRQ10 | Disabled | IRQ10 not available for PnP devices |
| | Enabled | IRQ10 available for PnP devices (default) |
| IRQ11 | Disabled | IRQ11 not available for PnP devices |
| | Enabled | IRQ11 available for PnP devices (default) |
| IRQ12 | Disabled | IRQ12 not available for PnP devices |
| | Enabled | IRQ12 available for PnP devices (default) |
| IRQ13 | Disabled | IRQ13 not available for PnP devices |
| | Enabled | IRQ13 available for PnP devices (default) |
| IRQ14 | Disabled | IRQ14 not available for PnP devices |
| | Enabled | IRQ14 available for PnP devices (default) |
| IRQ15 | Disabled | IRQ15 not available for PnP devices |
| | Enabled | IRQ15 available for PnP devices (default) |

3.11.3 PNP DMA CONFIGURATION

| Assign DMAx to PnP | Defines which DMAs are available for PnP devices | |
|--------------------|--|--|
| DMA0 | Disabled | DMA0 not available for PnP devices |
| | Enabled | DMA0 available for PnP devices (default) |
| DMA1 | Disabled | DMA1 not available for PnP devices |
| | Enabled | DMA1 available for PnP devices (default) |
| DMA2 | Disabled | DMA2 not available for PnP devices |
| | Enabled | DMA2 available for PnP devices (default) |
| DMA3 | Disabled | DMA3 not available for PnP devices |
| | Enabled | DMA3 available for PnP devices (default) |
| DMA4 | Disabled | DMA4 not available for PnP devices |
| | Enabled | DMA4 available for PnP devices (default) |
| DMA5 | Disabled | DMA5 not available for PnP devices |
| | Enabled | DMA5 available for PnP devices (default) |
| DMA6 | Disabled | DMA6 not available for PnP devices |
| | Enabled | DMA6 available for PnP devices (default) |
| DMA7 | Disabled | DMA7 not available for PnP devices |
| | Enabled | DMA7 available for PnP devices (default) |

4 PASSWORD CONFIGURATION

The system can be configured to prompt the user for a password when the BIOS setup is invoked.

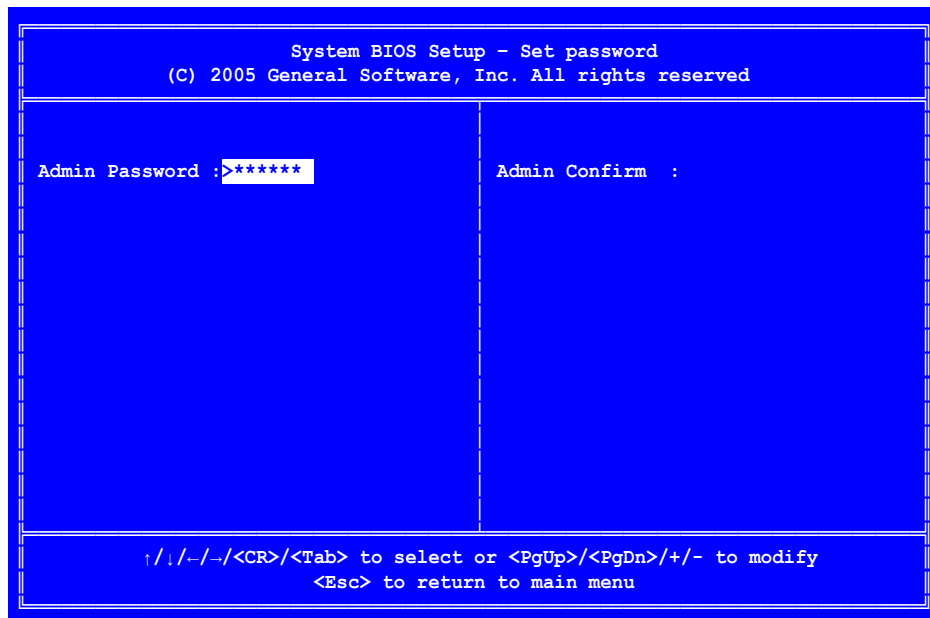


Figure 15: Password Configuration Screen

4.1 HOW TO SET A PASSWORD

- Type the password with the cursor located at 'Admin Password'. Clear the asterisks first using the <BACKSPACE> key, then type the new password. Note how asterisks (*) mask the password while typing.
- Type the password again with the cursor located at 'Admin Confirm'.
- Press <ESC> to return to the Main BIOS Setup Screen.
- The password is now set. Select 'Write to CMOS and Exit' to save the changes to CMOS.
- The next time the BIOS setup is invoked, the system asks for the password.

4.2 HOW TO CLEAR A PASSWORD

- Clear the masked password at 'Admin Password' using the <BACKSPACE> key.
- Make sure that the 'Admin Confirm' is also cleared (no asterisks).
- Press <ESC> to return to the Main BIOS Setup Screen.
- The password is now cleared. Select 'Write to CMOS and Exit' to save the changes to CMOS.
- The next time the BIOS setup is invoked, the system does not ask for a password anymore.

4.3 PASSWORDS DO NOT MATCH

Whenever there is a discrepancy between the 'Admin Password' and the 'Admin Confirm' fields and the user attempts to leave the password configuration screen by pressing <ESC>, the following dialog box appears:

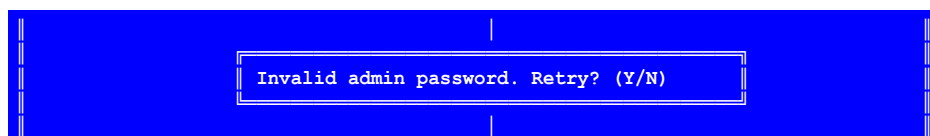


Figure 16: Invalid Admin Password Dialog Box

Pressing <Y> returns to the password configuration screen.

Pressing <N> returns to the Main BIOS Setup Screen, without changing the last saved password configuration.

5 NONVOLATILE BIOS SETUP

5.1 OVERVIEW

The MIP BIOS features the option to permanently save the BIOS settings into the Flash memory. This memory is nonvolatile, therefore the BIOS settings do not get lost if the battery is dead or removed. It is no longer necessary to manually reconfigure the BIOS in these cases.

If the BIOS detects that the settings are corrupt, it checks whether the Flash contains a valid image of the BIOS settings and if so, it loads the settings from the Flash. If there is no valid image in the Flash, it loads the factory default settings.

If the BIOS is updated, the Flash memory area holding the BIOS settings is erased as well. This prevents configuration errors if the new BIOS introduces additional BIOS settings or if it redefines existing settings.

To take full advantage of the nonvolatile BIOS setup feature, it is recommended to save the BIOS settings to the Flash once the BIOS is properly configured for your application.

NOTE

The date and time values will not be saved in the Flash.

NOTE

If a password has been set, the password will be saved in the Flash!

5.2 USAGE

The feature is controlled by two options in the Main BIOS Setup Menu.

- Save CMOS to nonvolatile Flash
- Load CMOS from nonvolatile Flash

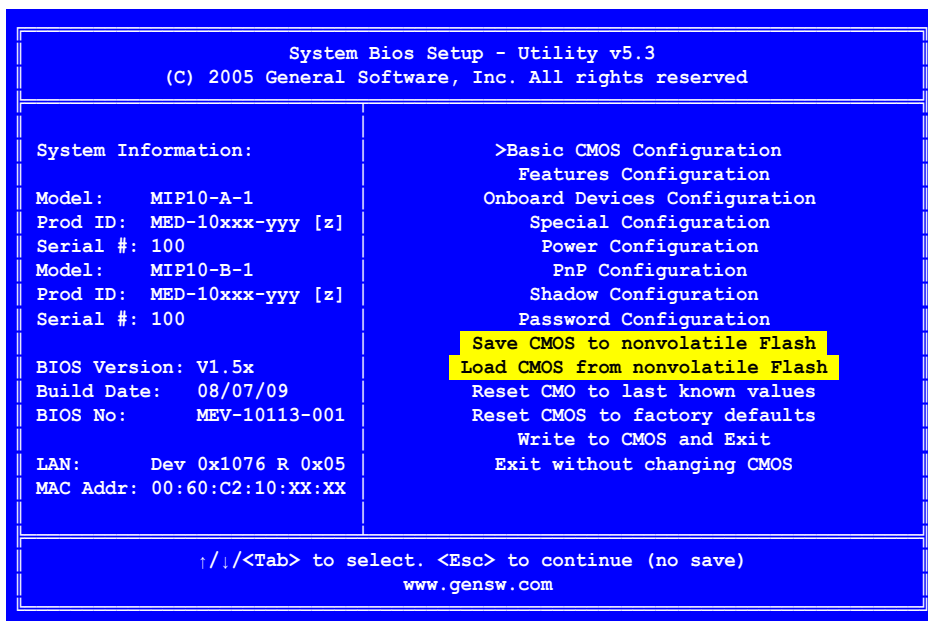


Figure 17: Main BIOS Setup Menu

5.2.1 SAVE CMOS TO NONVOLATILE FLASH

This writes the current BIOS settings to the Flash.
A dialog box pops up and asks for confirmation.

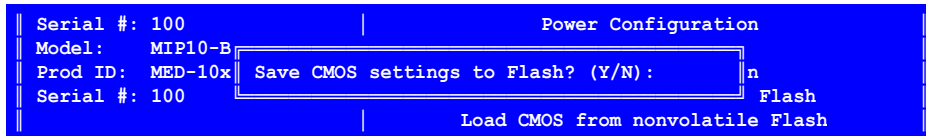


Figure 18: Save CMOS Dialog Box

Press <Y> to save the BIOS settings in the Flash or <N> to cancel and return to the main BIOS setup menu.

5.2.2 LOAD CMOS FROM NONVOLATILE FLASH

Use this to manually read the BIOS settings from the Flash.
A dialog box pops up and asks for confirmation.

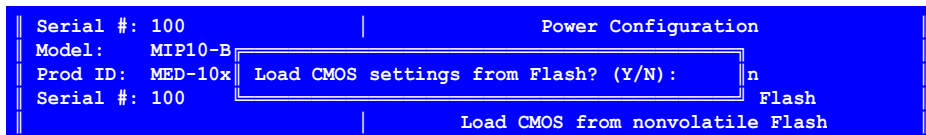


Figure 19: Load CMOS Dialog Box

Press <Y> to load the BIOS settings from the Flash or <N> to cancel and return to the main BIOS setup menu.

5.2.2.1 CMOS LOAD ERROR

If there is no valid image of the BIOS settings stored in the Flash (e.g. directly after a BIOS update), the following dialog box pops up, indicating that the BIOS settings have not been loaded from the Flash.



Figure 20: Load CMOS Error Dialog

In this case, press any key to return to the main BIOS setup menu.

6 USB BOOT

6.1 OVERVIEW

The MIP BIOS supports booting from USB mass storage devices, such as:

- CDROM drives
- Hard disk drives
- Memory Sticks
- Floppy disk drives

NOTE

If you experience problems with a certain USB device, please try a different model. There is a vast variety of USB devices available on the market, and some of them may prove incompatible with the USB host controller of the MIP.

6.2 BIOS SETTINGS

The following are the necessary steps to configure the system to boot from USB devices.

- Make sure that the options 'System Management Mode' and 'UsbMassStorage' are both enabled. These options are located in the Features Configuration menu.

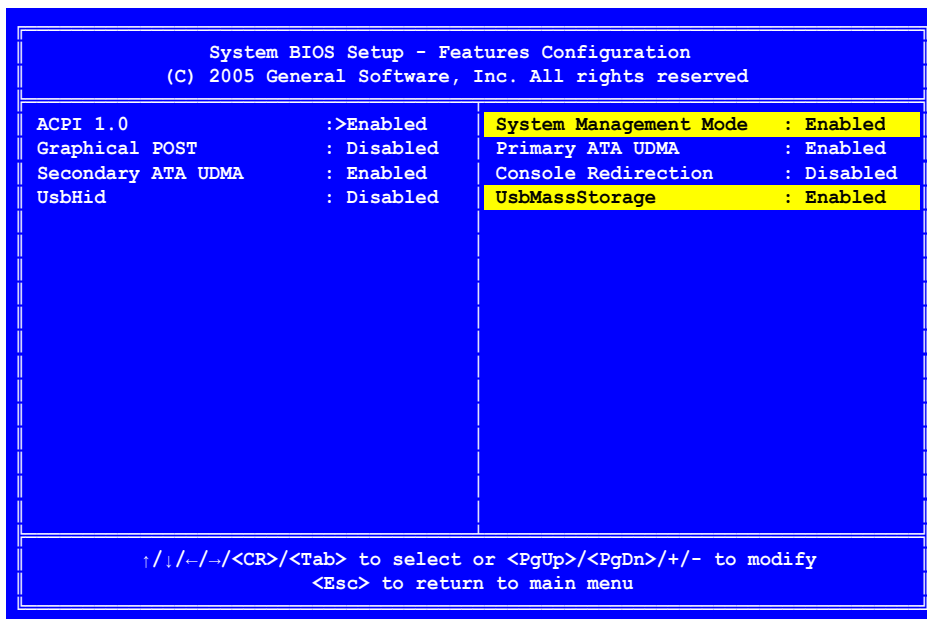


Figure 21: Features Configuration for USB Boot

- Configure the USB drive in the Basic CMOS Configuration menu.
Example configuration:

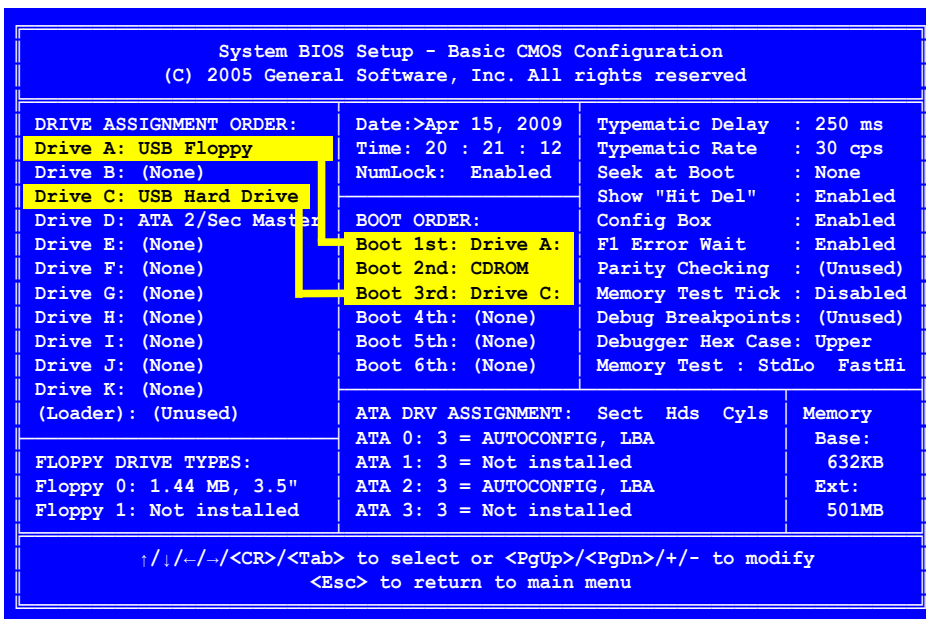


Figure 22: Basic CMOS Configuration for USB Boot

- To boot from a USB CDROM drive:**
 - Select 'CDROM' in the 'Boot Order' menu. 'Drive Assignment Order' does not have to be configured.

In the above example screen, the system is configured to boot from USB CDROM as second boot source.
- To boot from a USB Hard Disk drive (e.g. memory stick, external hard disk drive):**
 - Configure one of drives C: thru K: as 'USD Hard Drive' in the 'Drive Assignment Order' menu.
 - Make sure that in the 'Boot Order' menu, the respective drive is selected as well.

In the above example screen, the system is configured to boot from USB Hard Disk drive as third boot source.
- To boot from a USB Floppy:**
 - Configure one of drives A: thru B: as 'USB Floppy' in the 'Drive Assignment Order' menu.
 - Make sure that in the 'Boot Order' menu, the respective drive is selected as well.

In the above example screen, the system is configured to boot from USB Floppy drive A: as first boot source.

7 NETWORK BOOT (PXE)

The MIP8 / MIP9 / MIP10 / MIP11 BIOS supports booting from the onboard Ethernet controller using the PXE protocol.

The following message indicates PXE being initialized:

```
Initializing Intel(R) Boot Agent GE v1.2.70
PXE 2.1 Build 086 (WfM 2.0)
Press Ctrl+S to enter the Setup Menu...
```

Figure 23: PXE Boot Message

7.1 PXE SETUP MENU

The PXE setup menu is entered by pressing CTRL+S when indicated by the PXE initialization message displayed above.

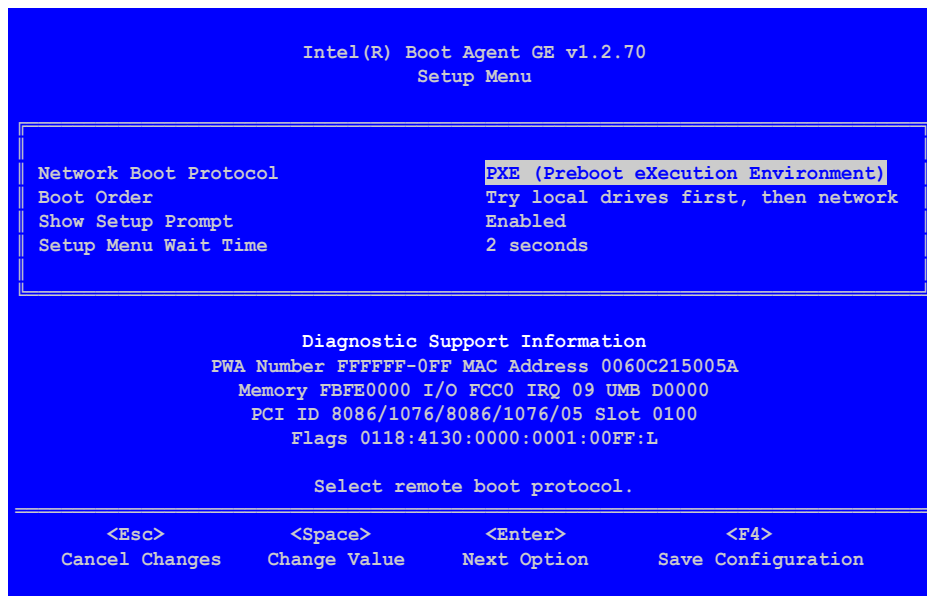


Figure 24: PXE Setup Menu

The PXE setup menu contains configurable settings as well as information about the Ethernet controller (such as MAC address, PCI resource consumption etc.).

7.2 PXE CONFIGURATION OPTIONS

The following table shows the configuration options.

| Network Boot Protocol | | |
|-----------------------|--------------------------------------|--|
| default | PXE (Preboot eXecution Environment) | Use PXE as boot protocol |
| Boot Order | | |
| | Try network first, then local drives | If no boot source is found on the network, the standard BIOS boot order (refer to section 3.5.3) is executed. Otherwise, the system boots from network. |
| default | Try local drives first, then network | If the BIOS boot order (refer to section 3.5.3) does not contain a bootable device, the network boot is executed. Otherwise, the system boots from a bootable local drive. |
| | Try network only | The system boots from network only. The BIOS boot order (refer to section 3.5.3) is skipped. |
| | Try local drives only | The system boots from local drives as configured in the BIOS boot order (refer to section 3.5.3) only. Network boot is skipped. |
| Show Setup Prompt | | |
| | Disabled | Do not show "Press Ctrl+S to enter the Setup Menu..." |
| default | Enabled | Show "Press Ctrl+S to enter the Setup Menu..." |
| Setup Menu Wait Time | | |
| | 0 | Waits 0 sec for Ctrl+S |
| default | 2 | Waits 2 sec for Ctrl+S |
| | 3 | Waits 3 sec for Ctrl+S |
| | 5 | Waits 5 sec for Ctrl+S |

7.3 CHANGING THE CONFIGURATION

| | |
|---------|------------------------------------|
| <ESC> | Leave Setup Menu and lose changes. |
| <SPACE> | Change value. |
| <ENTER> | Jump to next option. |
| <F4> | Save changes and leave Setup menu. |

7.4 BOOTING FROM NETWORK

Setting up a server that provides bootable images for network clients is a non-easy task which is beyond the scope of this manual. The MIP merely makes available the feature of booting from a correctly configured boot server.

Please visit the Intel website at <http://support.intel.com/support/network/adapter/pro100/bootagent/index.htm> for further information.

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